

JANUARY 2016 WEATHER SUMMARY FOR THE CENTRAL CALIFORNIA INTERIOR

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New Year's Day of 2016 started with a cold morning, enough for dense freezing fog to develop in the San Joaquin Valley where temperatures reached the mid to upper 20s in the coldest locations. There were widespread reports of visibility below a quarter mile; quite a few locations had visibility of around 300 feet or less, including at Hanford, Visalia, Selma, and Kingsburg. A southeasterly flow set up that night and produced gusty winds through the passes of the Tehachapi Mountains, especially near the Grapevine along Interstate 5 where gusts reached above 60 mph.

The gusty winds continued at times during the 2nd and 3rd near the Grapevine as the southeasterly flow persisted. Some other locations in the Tehachapi Mountains (such as along Highway 58 through Keene and in Bear Valley Springs above Tehachapi) experienced gusty winds at times on the 3rd; gusts were around 50 to 60 mph. In addition, locations in the south end of the San Joaquin Valley, such as Arvin and Lamont, had gusts to around 35 mph. A few light sprinkles and snow showers developed on the 2nd due to a weak upper-level disturbance, mainly over the Sierra Nevada.

On the night of the 3rd and into the morning of the 4th, the first of a series of low pressure systems brought some showers to the Kern County desert and parts of the San Joaquin Valley. The next system arrived on the 5th and continued into the 6th; this was the wettest and coldest system of the series. During this period, over an inch of rain fell along the east side of the San Joaquin Valley; other parts of the valley received around a quarter to half an inch. Around foot to a foot and a half of snow fell in the Sierra Nevada as far south as the Tulare County portion of the southern Sierra Nevada. In addition, several inches of snow fell in the Tehachapi Mountains and the far southern Sierra Nevada in Kern County, including in Tehachapi, during the morning and afternoon of the 6th.

On the 7th through the 9th, the weather remained unsettled with periods of clouds over the San Joaquin Valley and periods of generally light precipitation throughout the region. Dense fog was reported on the 8th in the San Joaquin Valley as the sky was briefly clear during the early morning.

There was a brief period of quiet weather with weak high pressure that set up on the night of the 9th and continued into the 11th. However, this meant more dense and widespread Tule Fog development in the San Joaquin Valley in the nights and mornings on the 9th and 10th.

A progressive pattern of relatively weak low pressure systems continued during the 12th through the 15th. There were occasional periods of gusty winds through the passes and canyons in Kern County with the passage of each system. In addition, there were even brief periods of southerly winds ahead of each low pressure system that led to relatively short episodes of strong and gusty winds through the passes leading into the San Joaquin Valley. In fact, there was a report of a 74 mph gust at the Grapevine CHP (California Highway Patrol) station during a 90 minute period when 50 mph or greater gusts occurred on the afternoon of the 12th. Between each system there were periods of Tule Fog development in the San Joaquin Valley with brief periods of visibility below a quarter mile, but generally with no prolonged periods of widespread fog or persistent low cloud cover. High pressure ridging was near enough to keep temperatures mild or a little above average, but generally not strong and persistently anchored over central California. These systems provided generally light amounts of precipitation, except several inches of snow fell in the Sierra Nevada in Yosemite National Park, including nine inches at Tuolumne Meadows overnight on the 14th-15th. During this period, especially in the early pre-dawn morning hours of the 15th, there were some strong wind gusts above 80 mph through the passes and canyons in eastern Kern County, including at Indian Wells Canyon (near Highway 14 and 395 split to the west of Inyokern), Bird Springs Pass (a mountain top, about 15 miles northeast of Tehachapi at an elevation around 6,200 feet), and Laurel Mountain (south of Ridgecrest in the El Paso Mountains).

During the 16th and 17th, there were a couple of weak systems that passed over our warning and forecast area, although the first one brought nine inches of snow at Tuolumne Meadows in Yosemite National Park by the morning of the 16th and the previous night. However, there were lesser snow amounts on the 17th in the Sierra Nevada. These systems brought enough cloud cover to prevent fog development in the San Joaquin Valley in the nights and mornings of these days. Rain amounts were generally less than a tenth of an inch with each of these systems in the San Joaquin Valley and around a quarter inch in the Sierra Nevada and adjacent foothills from Tulare County and northward below the snow line.

This relatively active weather pattern continued to produce precipitation each day from the 18th and through the morning of the 22nd, except on the 20th when a weak ridge of high pressure quickly moved over the region and brought locally dense fog to the San Joaquin Valley. Precipitation amounts were generally a little higher during this period, compared to the ones during the previous week. In fact, many San Joaquin Valley locations received around a quarter to half an inch with each system starting on the 19th, including on the east side, but mainly north of Kern County. Locations in the Sierra Nevada received from several inches to up to a foot and

a half with each system during the 19th and again on the 21st-22nd, especially above 6000 feet. In parts of the Sierra Nevada foothills, over an inch of rain fell below the snow line, mainly from Fresno County and northward. The system during the 21st-22nd brought the most snow to the Sierra, including in Yosemite National Park.

High pressure returned to California and much of the Southwestern United States on the 25th; however, some minor disturbances brought mid- and upper-level clouds. This cloud cover inhibited fog development in the San Joaquin Valley due to its persistence during the overnight and early morning hours, at least in the southern and central portions during the morning commuting hours of the 26th and 27th. Temperatures have been generally slightly above average for this period.

The next low pressure system arrived on the 29th and brought precipitation to the central California interior during the 30th and into the last day of the month. The 31st was the most active day in terms of weather, although there were gusty winds during the 30th in eastern Kern County. On the 31st, temperatures fell dramatically in the mountains, including as far south as Kern County, while there was still plenty of precipitation occurring in the afternoon and evening hours. Snow levels fell below 3000 feet by the afternoon in the Tehachapi Mountains and Sierra foothills and brought several inches snow to quite a few locations. Heavy rain fell in the San Joaquin Valley and broke records for all five of our ASOS locations (Bakersfield, Fresno, Hanford, Madera, and Merced) on the 31st; quite a few locations received over an inch of rain that day. Some strong thunderstorms developed in the Kern County desert in the afternoon and produced gusty winds, although these were ahead of the cold air pool which soon arrived to the area. Due to this colder air pool and a strong jet stream moving from the northwest, some isolated thunderstorms occurred during the evening of the 31st in Porterville, which produced some fairly large hail, estimated up to around an inch and a quarter in diameter (per photos provided on our Facebook page). There were also periods of strong and gusty winds during the last two days of the month; the strongest winds were reported on the 30th in the favored locations in eastern Kern County, including Mojave (gust to 79 mph) and Indian Wells Canyon (gust to 91 mph), as well as parts of the San Joaquin Valley (including the west side) reported gusts around 35-40 mph on the afternoon and evening hours of the 31st. The month indeed ended with very active weather, and this system continued to bring significant weather-related impacts, including a few inches of snow at elevations even below 2000 feet, after the 31st (more detail in next month's outlook).

In summary, most of the forecast area received above average precipitation (see Fig 1) and mainly above average temperatures (see Fig 2) for the month. One item of significance was Fresno's total monthly precipitation was the 9th highest on record for the month of January (see also Table 1).

A note on the current El Nino signature: While El Nino continues to show record warmth in the tropical Pacific Ocean with temperatures reaching as much as 3-4 degrees Celsius (5-7 degrees Fahrenheit), or on average about 2.3 degrees Celsius (around 4 degrees Fahrenheit), in the favored region, the warming has likely already peaked for this particular event. As shown in Figure 1 below, the above average precipitation has tended to favor the east side of the San Joaquin Valley, mainly from Fresno County northward. A similar pattern also occurred during November-December, 2015. El Nino, as well as other teleconnection patterns throughout the Pacific Ocean, continues to require much study and has a limited historical record (e.g., Oceanic Nino Index values are available from the Climate Prediction Center, www.cpc.ncep.noaa.gov, since 1951. Another dataset contains the Southern Oscillation Index values, or the measure of Tahiti's sea level pressure minus the sea level pressure at Darwin, Australia; these values are available back to the 1870s). One might ask whether this type of pattern is typical of strong El Nino conditions. The answer remains to be determined, as the meteorological community continues to study this pattern in close detail.

Table 1 - Jan 2016 Summary Statistics for ASOS locations				
Location	Monthly Avg Temp	Departure From Normal	Total Monthly Precipitation	Departure From Normal
Bakersfield	51.8	4.0	1.95	0.79
Fresno	50.0	3.4	4.42	2.23
Hanford	49.0	3.7	2.87	0.83
Madera	50.1	4.5	3.63	1.18
Merced	49.1	4.1	4.49	1.88

RECORDS TIED OR BROKEN IN JANUARY

BAKERSFIELD

31st...record daily high precipitation of 0.93 inch reached; old was 0.76 inch set for the date back in 1945.

Bakersfield reached its 15th wettest January on record. Top 10 wettest January monthly total precipitation amounts/years:

1ST...3.90 inches/1999

2ND...3.84 inches /1933

3RD...3.24 inches /1914
4TH...3.06 inches /1916
5TH...2.87 inches /1943
6TH...2.60 inches /1980
7TH...2.51 inches /2005
8TH...2.50 inches /1895
9TH...2.47 inches /1947
10TH...2.33 inches /1993
15TH...1.95 inches /2016

FRESNO

31st...record daily high precipitation of 0.98 inch reached; old was 0.96 inch set for the date back in 1963.

Fresno reached its 9th wettest January on record at 4.42 inches. Top 10 wettest January monthly total precipitation amounts/years:

1ST...8.56 inches /1969
2ND...5.89 inches /1940
3RD...5.42 inches /1995
4TH...5.18 inches /1993
5TH...5.17 inches /1916
6TH...5.14 inches /1983
7TH...4.94 inches /1914
8TH...4.44 inches /1909
9TH...4.42 inches /2016
10TH...4.23 inches /1911

...AIRPORT-SPECIFIC RECORDS BELOW FOR HANFORD...MADERA AND MERCED
ON JANUARY 31ST...

*Please note that records for the airports below are only available back to 1998.

Hanford Municipal Airport received 0.66 inch on January 31st; this broke their record high daily precipitation for the date. The previous record high for this date was 0.18 inch set back in 1999.

Madera Municipal Airport received 0.59 inch on January 31st; this broke their record high daily precipitation for the date. The previous record high for this date was 0.30 inch set back in 1999.

Merced municipal airport received 0.34 inch on January 31st; this broke their record high daily precipitation for the date. The previous record high for this date was 0.01 inch set back in 2008.

Fig 1 - Percent of normal precipitation for January 2016 (image courtesy of Western Region Climate Center):

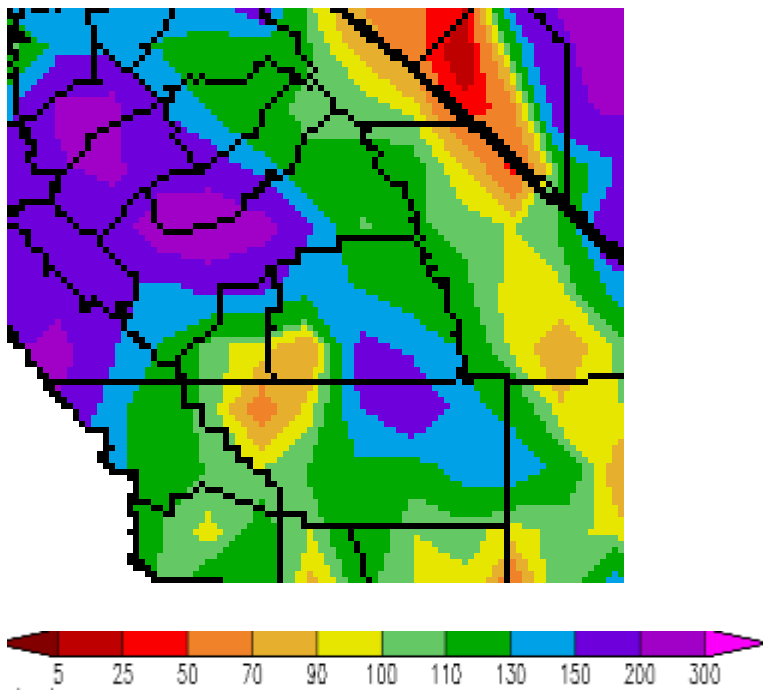


Fig 2 - Departure from average temperature for January 2016 (image courtesy of Western Region Climate Center):

